

PATENT ABSTRACTS OF JAPAN

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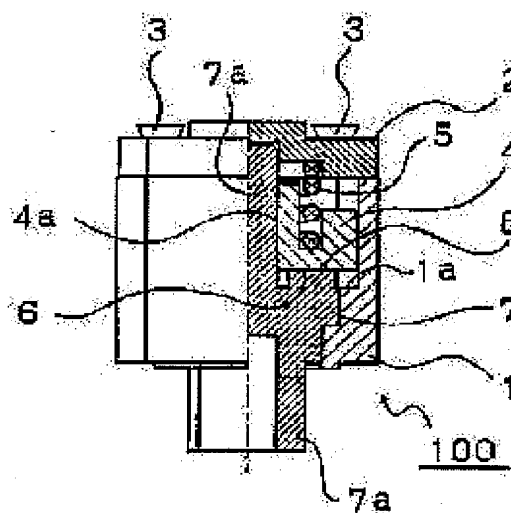
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(54) DETENT TYPE HINGE, AND CELLULAR PHONE WITH LID AND ITS CONTAINER WITH LID USING THE HINGE

(57)Abstract:

PROBLEM TO BE SOLVED: To greatly improve the operability by continuously or intermittently effecting a large number of click stop operations using a cam surface having a large number of teeth to stop a lid at an arbitrary angular position.

SOLUTION: A detent type hinge is provided with a cover 2 provided on one end of a cylindrical case 1, a cam body 4 which is provided in the cylindrical case 1 in a movable manner in the axial direction through a spring 5 and has a ring-like first cam surface 6 on an end surface, and a rotor 7 which is rotatably provided in the cylindrical case 1, pierces the cam body 4, and has a second cam surface 8 to be abutted on the first cam surface 6, and the rotor 7 is rotated by the abutting of the cam surfaces 6, 8 with at least two click stop operation.



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2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1]A detent type hinge having composition characterized by comprising the following which is provided with a rotator (7) and rotates said rotator (7) with at least two or more moderation operations by contact of each of said cam surface (6, 8).

Covering (2) provided in an end of a cylindrical case (1).

A cam object (4) which is established via a spring (5) in said cylindrical case (1), enabling free axial movement, and has the 1st cyclic cam surface (6) in the end face. The 2nd cam surface (8) it is provided in said cylindrical case (1), enabling free rotation, and said cam object (4) is penetrated, and contacts said 1st cam surface (6).

[Claim 2]The detent type hinge according to claim 1 constituting said moderation operation continuously or intermittently.

[Claim 3]Said each cam surface (6, 8) is [having consisted of ratchet cams and having changed mutually a number of teeth of each cam surface (6 8), and] the feature, ***** 1, or a detent type hinge given in 2.

[Claim 4]The detent type hinge according to any one of claims 1 to 3 attaching strength to said moderation operation by making the depth of a part of gear teeth of each of said cam surface (6, 8) deeper than other gear teeth.

[Claim 5]A detent type hinge which is provided with the following and characterized by absorbing modification of shaft orientations in case said each cam surface (6, 8) performs moderation operation by said notching part (200).

A cam object (4) which is provided in an end of a cylindrical case (1) and has the 1st cam surface (6).

A rotator (7) provided in said cylindrical case (1) enabling free rotation.

The 2nd cam surface (8) that is established in said rotator (7) and contacts said 1st cam surface (6).

One piece formed in said rotator (7), or two or more notching parts (200).

[Claim 6]A detent type hinge considering said axis of rotation (21) as composition rotated with moderation operation when it has the following and said each ball (26) contacts said concavo-convex cam surface (20).

Covering (2) provided in an end of a case (1) where the whole makes tubed.

A concavo-convex cam surface (20) formed in a wall by the side of said covering (2) of said case (1) cyclic.

The axis of rotation (21) established in said case (1) enabling free rotation.

One or more balls (26) provided in said axis of rotation (21) by spring (25) energization.

[Claim 7]A cellular phone with a lid using a detent type hinge having composition which forms which detent type hinge (100) of said claims 1 thru/or 6 in an opens part (102a) of a lid (102) of a cellular phone (101), and opens and closes said lid (102) at a detent ceremony.

[Claim 8]A container with a lid using a detent type hinge having composition which forms which detent type hinge (100) of said claims 1 thru/or 6 in an opens part (121a) of a lid (121) of a container (120), and opens and closes said lid (121) at a detent ceremony.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the new improvement for performing at least two or more moderation operations (detent operation) especially about the cellular phone with a lid and the container with a lid which used a detent type hinge and it.

[0002]

[Description of the Prior Art]As this used kind of a detent type hinge, conventionally, For example, as shown in JP,8-121462,A and JP,8-247134,A, the non-circular cam, i.e., the cam of a rhombus or an ellipse form, was pinched by one pair of flat spring, and moderation operation had been obtained by rotating this cam. In order to use for opening and closing of a lid in this case, the detent type hinge of the couple was attached to the root of a lid.

[0003]

[Problem(s) to be Solved by the Invention] Since the conventional detent type hinge was constituted as mentioned above, the following technical problems existed. That is, since it was the composition using an un-circular cam and the flat spring of the couple, it was impossible to have had composition which performs moderation operation of 2 times or more or many times only by performing one moderation operation.

[0004] This invention was made in order to solve the above technical problems, and an object of this invention is to provide the cellular phone with a lid and the container with a lid using the detent type hinge and it which enabled it to perform at least two or more moderation operations (detent operation) especially.

[0005]

[Means for Solving the Problem] Covering in which a detent type hinge by this invention was formed in an end of a cylindrical case, A cam object which is established via a spring in said cylindrical case, enabling free axial movement, and has the 1st cyclic cam surface in the end face, It has a rotator which it is provided in said cylindrical case, enabling free rotation, and said cam object is penetrated, and has said 1st cam surface and the 2nd contacting cam surface, Are the composition that said rotator rotates with at least two or more moderation operations by contact of each of said cam surface, and said moderation operation, Are the composition made continuously or intermittent, and said each cam surface consists of ratchet cams, It is the composition of having changed a number of teeth of each cam surface mutually, and is the composition of having attached strength to said moderation operation by making the depth of a part of gear teeth of each of said cam surface deeper than other gear teeth, A cam object which is provided in an end of a cylindrical case and has the 1st cam surface and a rotator provided in said cylindrical case enabling free rotation, It is provided in said rotator and has said 1st cam surface, the 2nd contacting cam surface, and one piece or two or more notching parts which were formed in said rotator, Covering provided in an end of a case where it is the composition which absorbs modification of shaft orientations in case said each cam surface performs moderation operation by said notching part, and the whole makes tubed, A concavo-convex cam surface formed in a wall by the side of said covering of said case cyclic, When it has the axis of rotation established in said case enabling free rotation, and two or more balls provided in said axis of rotation by spring energization and said each ball touches said concavo-convex cam surface, Said axis of rotation forms composition rotated with moderation operation, and which detent type hinge of said claims 1 thru/or 6 in an opens part of a lid of a cellular phone, It is the

composition which opens and closes said lid at a detent ceremony, and is the composition forms which detent type hinge of said claims 1 thru/or 6 in an opens part of a lid of a container, and open and close said lid at a detent ceremony further.

[0006]

[Embodiment of the Invention] Hereafter, an embodiment with a preferred detent type hinge by this invention is described with a drawing. First, it is a cylindrical case which is shown with the numerals 1 in drawing 5 from drawing 1, and the covering 2 is being fixed to the end of this cylindrical case 1 by the caulking part 3, and the cam object 4 is established in this cylindrical case 1. This cam object 4 is established with the spring 5 formed between said coverings 2, enabling free axial movement, and in order to restrict that movement, the step 1a is formed in the wall of the cylindrical case 1.

[0007] The 1st cam surface 6 that consists of a cyclic ratchet cam (other cam shape is good) as shown by drawing 2 and drawing 3 is formed in the end face of said cam object 4. The rod 7a of the rotator 7 shown by drawing 4 and drawing 5 penetrates in the breakthrough 4a formed in the center of this cam object 4, enabling free rotation, and is provided in it. The 2nd cam surface 8 that consists of a cyclic ratchet cam (other cam shape is good) is formed in the end face of this rotator 7, and this 2nd cam 8 is in contact with the 1st cam surface 6.

[0008] In the above-mentioned composition, if the rotator 7 is rotated via the knob 7 of the rotator 7, whenever each cam surfaces 6 and 8 contact mutually and a valley gears with a mountain, the cam object 4 can repeat axial movement via the spring 5, and, as for the rotator 7, rotating operation can be performed with moderation operation. This moderation operation can be made intermittent by becoming continuous if each cam surfaces 6 and 8 are made into the same number of teeth, lessening one side and changing it mutually rather than others. Strength can be attached to moderation operation by making the depth of a part of gear teeth of each cam surfaces 6 and 8 deeper than other gear teeth. Drawing 6 shows other examples of drawing 1, did not use a spring for the rotator 7, but formed two or more notching parts 200, modification of the shaft orientations at the time of moderation operation of each cam surfaces 6 and 8 was absorbed by the notching part 200, the cam object 4 serves as covering, and this cam object is being fixed to the case 1 by the caulking part 3.

[0009] Next, the composition shown by drawing 14 from drawing 8 shows other gestalten of this invention. That is, it is a case which is shown with the numerals 1 in drawing 14 from drawing 8 where the whole makes tubed, and the tabular covering 2 which consists of stainless steel etc. is formed in the end of this case 1. The

concavo-convex cam surface 20 formed in cyclic is formed in the wall by the side of said covering 2 of this case 1, and this concavo-convex cam surface 20 is formed of the circular waveform, as shown by drawing 14 from drawing 12.

[0010]In said case 1, the projection 21a which the axis of rotation 21 shown by drawing 11 was established enabling free rotation, and was formed in the end of this axis of rotation 21 penetrates the hole 2a of said covering 2, and is provided, enabling free rotation. The holding hole 24 formed in the direction which intersects perpendicularly with shaft orientations is formed in this axis of rotation 21, and the balls 26, such as a steel ball of a couple, are held via the spring 25 which consists of springs in this holding hole 24. Each of these balls 26 are energized with the spring 25 to the method of outside, and each ball 26 is in contact with said concavo-convex cam surface 20. By forming the un-circular crevice 27 and combining a bar member (not shown) with the end side from the exterior, it is constituted by said axis of rotation 21 so that the axis of rotation 21 can rotate. Therefore, by rotating said axis of rotation 21, each ball 26 can contact the concavo-convex cam surface 20 of the case 1, can obtain arbitrary moderation operations with the number of the gear teeth of this concavo-convex cam surface 20, and like the above-mentioned embodiment, Only one large moderation operation can be obtained by making the depth of one gear tooth larger than others.

[0011]Next, if the detent type hinge 100 explained by each above-mentioned embodiment is held at a moderation ceremony (detent type) by providing in the opens part 102a of the lid 102 of the cellular phone 101 with a lid shown by drawing 15, it can perform opening and closing of the lid 102 accompanied by many moderation operations. It can hold to multi stage-like opening and closing like the above-mentioned with the detent type hinge 100 by forming the detent type hinge 100 in the opens part 121a of the lid 121 of the containers 120, such as a compact of cosmetics, like drawing 16.

[0012]

[Effect of the Invention]The detent type hinge by this invention many moderation operations using the cam surface which has many gear teeth Continuation or since it can carry out intermittently, Since opening and closing of the lid of a cellular phone with a lid or the container with a lid for makeup can be performed with moderation operation of the outside stage, a lid can be stopped by the arbitrary angular positions and user-friendliness can be raised more nearly substantially than before.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a sectional view showing the detent type hinge by this invention.

[Drawing 2] It is a sectional view showing the important section of drawing 1.

[Drawing 3] It is a top view showing the important section of drawing 1.

[Drawing 4] It is a half section figure showing the important section of drawing 1.

[Drawing 5] It is a top view of drawing 4.

[Drawing 6] It is a lineblock diagram showing other gestalten of drawing 1.

[Drawing 7] It is a sectional view showing the rotator of drawing 6.

[Drawing 8] It is a sectional view showing other gestalten of drawing 1.

[Drawing 9] It is a right side view of drawing 8.

[Drawing 10] It is a bottom view of drawing 8.

[Drawing 11] It is a side view showing the rotator of drawing 8.

[Drawing 12] It is a sectional view of the important section of drawing 8.

[Drawing 13] It is a left side view of drawing 12.

[Drawing 14] It is an enlarged drawing of the important section of drawing 13.

[Drawing 15] It is a perspective view showing a cellular phone with a lid.

[Drawing 16] It is a container in which a container with a lid is shown.

[Description of Notations]

1 Case

2 Covering

4 Cam object

5 Spring

6 The 1st cam surface

7 Rotator

8 The 2nd cam surface

20 A concavo-convex cam surface

21 Axis of rotation

25 Spring

26 Ball

27 Crevice

100 Detent type hinge

101 Cellular phone

102 Lid

102a Opens part

120 Container

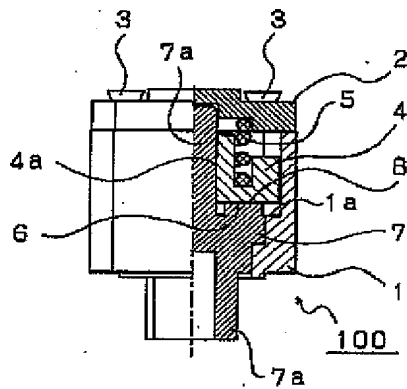
121 Lid

121a Opens part

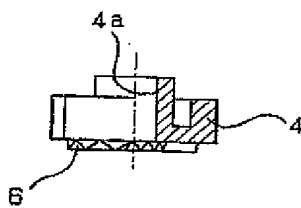
200 Notching part

DRAWINGS

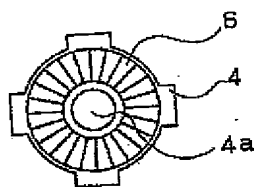
[Drawing 1]



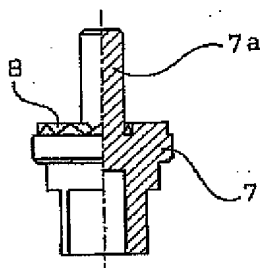
[Drawing 2]



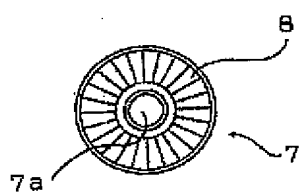
[Drawing 3]



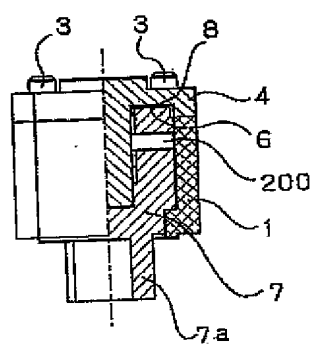
[Drawing 4]



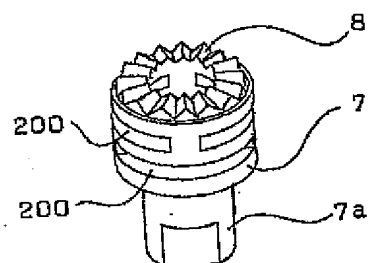
[Drawing 5]



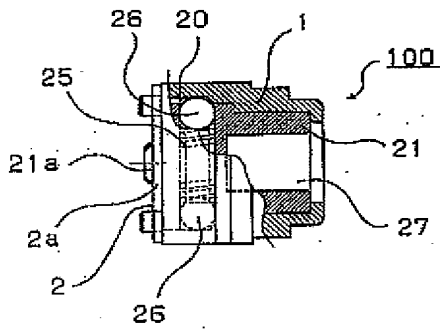
[Drawing 6]



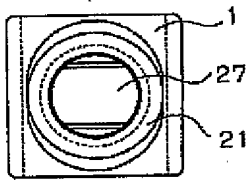
[Drawing 7]



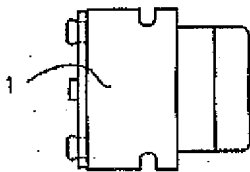
[Drawing 8]



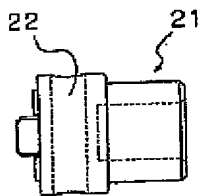
[Drawing 9]



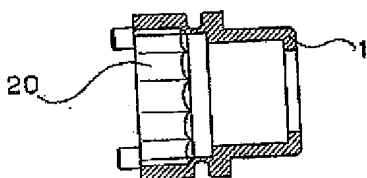
[Drawing 10]



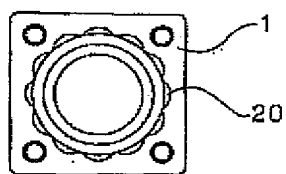
[Drawing 11]



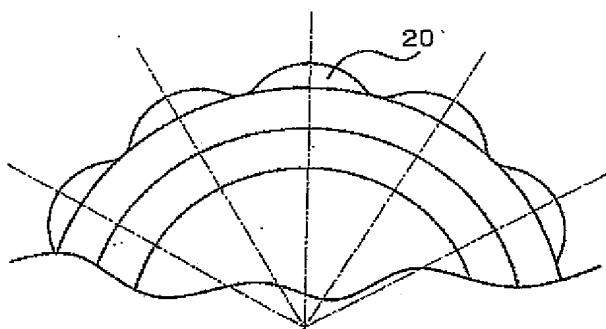
[Drawing 12]



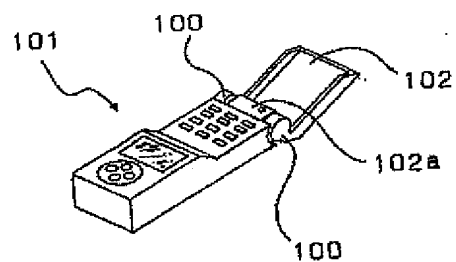
[Drawing 13]



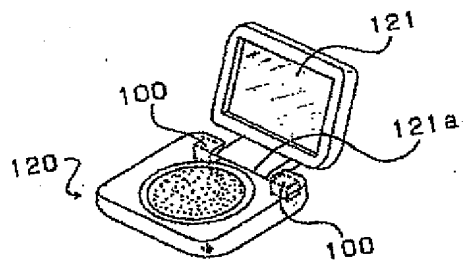
[Drawing 14]



[Drawing 15]



[Drawing 16]



[Translation done.]